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JC09 Rec'd PCT/PTO 29 OCT 2001

10/018302

Practitioner's Docket No. U 013688-5

Optional Customer No. Bar Code



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PATENT TRADEMARK OFFICE

CHAPTER II

**TRANSMITTAL LETTER  
TO THE UNITED STATES ELECTED OFFICE (EO/US)  
(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)**

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/BE00/00044	21 APRIL 2000	29 APRIL 1999
TITLE OF INVENTION		
PROCESS FOR INKING A PRINTING PLATE WITH THERMOPLASTIC INKS AND INK TANKS TO BE USED THEREIN		
APPLICANT(S)		
LAURENT DE VOLDER		

**Box PCT**  
**Assistant Commissioner for Patents**  
**Washington D.C. 20231**  
**ATTENTION: EO/US**

*NOTE: The completion of those filing requirements that can be made at a time later than 30 months from the priority date results from the Commissioner exercising his judgment under the authority granted under 35 USC 371(d). The filing receipt will show the actual date of receipt of the last item completing the entry into the national phase. See 37 C.F.R.*

**CERTIFICATION UNDER 37 C.F.R. 1.10\***  
(Express Mail label number is **mandatory**.)  
(Express Mail certification is **optional**.)

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on this date October 29, 2001, in an envelope as "Express Mail Post Office to Addressee," Mailing Label Number EV011018890 US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

CONNIE YANNOTTI  
(type or print name of person mailing paper)  
  
Signature of person mailing paper

**WARNING:** Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

**\*WARNING:** Each paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).  
"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will not be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

(Transmittal Letter to the United States Elected Office (EO/US)—page 1 of 8) 13-18

**EXPRESS MAIL LABEL**  
**NO.: EV011018890 US**

*§1.491 which states: "An international application enters the national state when the applicant has filed the documents and fees required by 35 USC 371(c) within the periods set forth in § 1.494 and § 1.495."*

**WARNING:** *Where the items are those which can be submitted to complete the entry of the international application into the national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. §1.10 must be used (since international application papers are not covered by an ordinary certificate of mailing - See 37 C.F.R. §1.8.*

**NOTE:** *Documents and fees must be clearly identified as a submission to enter the national state under 35 USC 371 otherwise the submission will be considered as being made under 35 USC 111. 37 C.F.R. § 1.494(f).*

1. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. 371:

- a. ☒ This express request to immediately begin national examination procedures (35 U.S.C. 371(f)).
- b. ☒ The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees (37 C.F.R. § 1.492) as indicated below:

2.Fees

CLAIMS FEE	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
[ ]*	TOTAL CLAIMS	17 - 20 =	0	x \$ 18.00 =	\$
	INDEPENDENT CLAIMS	1 - 3 =	0	x \$ 84.00 =	
	MULTIPLE DEPENDENT CLAIM(S) (if applicable) + \$280.00				
BASIC FEE**	<p>[ ] U.S. PTO WAS INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY          Where an International preliminary examination fee as set forth in § 1.482 has been paid on the international application to the U.S. PTO:          [ ] and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness) and industrial activity, as defined in PCT Article 33(2) to (4) have been satisfied for all the claims presented in the application entering the national stage (37 CFR 1.492(a)(4)) ..... \$100.00          [ ] and the above requirements are not met (37 CFR 1.492(a)(1)) ..... \$710.00</p> <p>[X] U.S. PTO WAS NOT INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY          Where no international preliminary examination fee as set forth in § 1.482 has been paid to the U.S. PTO, and payment of an international search fee as set forth in § 1.445(a)(2) to the U.S. PTO:          [ ] has been paid (37 CFR 1.492(a)(2)) ..... \$740.00          [ ] has not been paid (37 CFR 1.492(a)(3)) ..... \$1,040.00          [X] where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office (37 CFR 1.492(a)(5)) ..... \$890.00</p>				
	Total of above Calculations = \$890.00				
SMALL ENTITY	Reduction by ½ for filing by small entity, if applicable. Statement may also be filed. (note 37 CFR 1.9, 1.27, 1.28) - 445.00				
	Subtotal 445.00				
	Total National Fee \$ 445.00				
	Fee for recording the enclosed assignment document \$40.00 (37 CFR 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				
TOTAL	Total Fees enclosed \$ 445.00				

\*See attached Preliminary Amendment Reducing the Number of Claims.

- i. ☒ A check in the amount of \$ 445.00 to cover the above fees is enclosed.
  - ii. ☐ Please charge Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_.
- A duplicate copy of this sheet is enclosed.

**\*\*WARNING:** "To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date: \* \* \* (2) the basic national fee (see § 1.492(a)). The 30-month time limit may not be extended." 37 C.F.R. § 1.495(b).

**WARNING:** If the translation of the international application and/or the oath or declaration have not been submitted by the applicant within thirty (30) months from the priority date, such requirements may be met within a time period set by the Office. 37 C.F.R. § 1.495(b)(2). The payment of the surcharge set forth in § 1.492(e) is required as a condition for accepting the oath or declaration later than thirty (30) months after the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than thirty (30) months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 apply to the period which is set. Notice of Jan. 3, 1993, 1147 O.G. 29 to 40.

- 3. ☒ A copy of the International application as filed (35 U.S.C. 371(c)(2)):

**NOTE:** Section 1.495 (b) was amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment "The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date." Notice of Jan. 7, 1993, 1147 O.G. 29 to 40, at 35-36. See item 14c below.

- a. ☐ is transmitted herewith.
- b. ☐ is not required, as the application was filed with the United States Receiving Office.
- c. ☒ has been transmitted
  - i. ☒ by the International Bureau.  
Date of mailing of the application (from form PCT/IB/308): \_\_\_\_\_.
  - ii. ☐ by applicant on \_\_\_\_\_  
Date

- 4. ☒ A translation of the International application into the English language (35 U.S.C. 371(c)(2)):

- a. ☒ is transmitted herewith.
- b. ☐ is not required as the application was filed in English.
- c. ☐ was previously transmitted by applicant on \_\_\_\_\_  
Date
- d. ☐ will follow.

5. ☒ Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. 371(c)(3)):

*NOTE: The Notice of January 7, 1993 points out that 37 C.F.R. § 1.495(a) was amended to clarify the existing and continuing practice that PCT Article 19 amendments must be submitted by 30 months from the priority date and this deadline may not be extended. The Notice further advises that: "The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected." 1147 O.G. 29-40, at 36.*

- a. ☐ are transmitted herewith.  
b. ☐ have been transmitted  
i. ☐ by the International Bureau.  
Date of mailing of the amendment (from form PCT/IB/308): \_\_\_\_\_  
ii. ☐ by applicant on \_\_\_\_\_  
Date  
c. ☒ have not been transmitted as  
i. ☒ applicant chose not to make amendments under PCT Article 19.  
Date of mailing of Search Report (from form PCT/ISA/210): AUGUST 29, 2000.  
ii. ☐ the time limit for the submission of amendments has not yet expired.  
The amendments or a statement that amendments have not been made will be transmitted before the expiration of the time limit under PCT Rule 46.1.
6. ☒ A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. 371(c)(3)):  
a. ☐ is transmitted herewith.  
b. ☐ is not required as the amendments were made in the English language.  
c. ☒ has not been transmitted for reasons indicated at point 5(c) above.
7. ☒ A copy of the international examination report (PCT/IPEA/409)  
☒ is transmitted herewith.  
☐ is not required as the application was filed with the United States Receiving Office.
8. ☒ Annex(es) to the international preliminary examination report  
a. ☒ is/are transmitted herewith.  
b. ☐ is/are not required as the application was filed with the United States Receiving Office.
9. ☒ A translation of the annexes to the international preliminary examination report  
a. ☐ is transmitted herewith.  
b. ☒ is not required as the annexes are in the English language.

10. ☒ An oath or declaration of the inventor (35 U.S.C. 371(c)(4)) complying with 35 U.S.C. 115
- a. ☐ was previously submitted by applicant on \_\_\_\_\_  
Date
- b. ☐ is submitted herewith, and such oath or declaration
- i. ☐ is attached to the application.
- ii. ☐ identifies the application and any amendments under PCT Article 19 that were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that they were reviewed by the inventor as required by 37 C.F.R. 1.70.
- c. ☒ will follow.

Other document(s) or information included:

11. ☒ An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):
- a. ☒ is transmitted herewith.
- b. ☐ has been transmitted by the International Bureau.  
Date of mailing (from form PCT/IB/308): \_\_\_\_\_
- c. ☐ is not required, as the application was searched by the United States International Searching Authority.
- d. ☐ will be transmitted promptly upon request.
- e. ☐ has been submitted by applicant on \_\_\_\_\_  
Date
12. ☒ An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98:
- a. ☐ is transmitted herewith.  
Also transmitted herewith is/are:  
☐ Form PTO-1449 (PTO/SB/08A and 08B).  
☐ Copies of citations listed.
- b. ☒ will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. 371(c).
- c. ☐ was previously submitted by applicant on \_\_\_\_\_  
Date
13. ☐ An assignment document is transmitted herewith for recording.

A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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14. ☒ Additional documents:
- a. ☐ Copy of request (PCT/RO/101)
  - b. ☒ International Publication No. WO 00/66363
    - i. ☒ Specification, claims and drawing
    - ii. ☐ Front page only
  - c. ☒ Preliminary amendment (37 C.F.R. § 1.121)
  - d. ☐ Other
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
15. ☒ The above checked items are being transmitted
- a. ☒ before 30 months from any claimed priority date.
  - b. ☐ after 30 months.
16. ☐ Certain requirements under 35 U.S.C. 371 were previously submitted by the applicant on \_\_\_\_\_, namely:
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

#### AUTHORIZATION TO CHARGE ADDITIONAL FEES

**WARNING:** Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges if extra claims are authorized.

**NOTE:** "A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

**NOTE:** "Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

☒ The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to Account No. 12-0425.

☒ 37 C.F.R. 1.492(a)(1), (2), (3), and (4) (filing fees)

**WARNING:** Because failure to pay the national fee within 30 months without extension (37 C.F.R. § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.

☐ 37 C.F.R. 1.492(b), (c) and (d) (presentation of extra claims)

**NOTE:** Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must

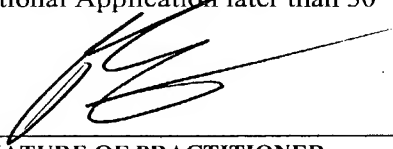
only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.

- ☒ 37 C.F.R. 1.17 (application processing fees)
- ☒ 37 C.F.R. 1.17(a)(1)-(5)(extension fees pursuant to § 1.136(a).
- ☒ 37 C.F.R. 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

- ☐ 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).

  
SIGNATURE OF PRACTITIONER

Reg. No.: 25,858

WILLIAM R. EVANS  
(type or print name of practitioner)

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26 WEST 61<sup>ST</sup> STREET  
NEW YORK, N.Y. 10023



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JC05 Rec'd PCT/PTO 29 OCT 2001

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: **LAURENT DE VOLDER**

International Application No.: PCT/BE00/00044

International Filing Date: 21 APRIL 2000

Priority Date: 29 APRIL 1999

For: **PROCESS FOR INKING A PRINTING PLATE WITH THERMOPLASTIC INKS  
AND INK TANKS TO BE USED THEREIN**

Attorney Docket No.: U 013688-5

**Commissioner of Patents and Trademarks  
Washington, D.C. 20231**

Sir:

**PRELIMINARY AMENDMENT**

Please amend the above identified application as follows:

**IN THE CLAIMS:**

7. (Amended) Ink tank according to claim 5, characterised in that  
above said doctor blade of above said synthetic substance is attached by an adhesive.

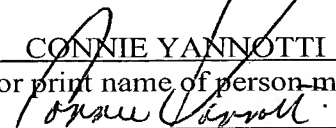
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**CERTIFICATE UNDER 37 CFR 1.10**

I hereby certify that this paper is being deposited with the United States Postal Service on this date OCTOBER 29, 2001 in an envelope as "EXPRESS MAIL POST OFFICE TO ADDRESSEE" Mailing Label Number EV 011018890 US addressed to the: Commissioner of Patents and Trademarks, Washington, D.C. 20231

CONNIE YANNOTTI

(Type or print name of person mailing paper)

  
(Signature of person mailing paper)

**NOTE:** Each paper or fee referred to as enclosed herein has the number of the "EXPRESS MAIL" mailing label place thereon prior to mailing 37 CFR 1.16(b).

**EXPRESS MAIL LABEL  
NO.: EV 011018890 US**



MARKED-UP COPY

7. (Amended) Ink tank according to [any one of] claim[s] 5 [and 6], characterised in that above said doctor blade of above said synthetic substance is attached by an adhesive.

9. (Amended) Ink tank according to [any one of] claim 4[-5], characterised in that above said doctor blade, during spraying or casting of above said synthetic substance of which above said ink tank is made, was joined to it.

12. (Amended) Ink tank according to [any one of] claim[s] 10 [and 11], characterised in that is elongated and forms with above said doctor blade an elongated ink gap.

15. (Amended) Ink tank according to [any one of] claim[s] 10 [-14], characterised in that two doctor blades are mounted facing each other.

16. (Amended) Ink tank according to [any one of] claim[s] 10 [-15], characterised in that above said doctor blade forms a closed circle and that a portion of the doctor blade extends according to above said negative angle.

17. (Amended) Ink tank according to [any one of] claim[s] 13 [-16], characterised in that above said housing, a heating resistance is mounted.

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PCT/BE00/00044

S/PRTS

Process for inking a printing plate with thermoplastic inks and ink tanks  
to be used therein

5 This invention relates to a process for inking a printing plate attached to a holder, with a thermoplastic ink, to be used in pad printing, wherein a relative movement is maintained between the holder and an ink tank filled with thermoplastic ink.

10 For the printing of substrates such as glass, ceramics and china, mostly a so-called thermoplastic ink is used. Such an ink has the viscosity of a thick paste at room temperature. For printing, this ink is heated to about 80°C, whereby it becomes very fluid. After printing, the very fluid ink on the printed substrate cools down to room temperature and consequently coagulates again. The print on the substrate is fixed by baking the printed product for a certain time at high temperature (around 800°C). By doing so, the ink vitrifies and fuses to the substrate. The result is a strongly adhesive print  
15 that does not fade or wear off, even when frequently cleaned in the dishwasher.

Silkscreen printing is at present the current process used for printing glass with thermoplastic inks to obtain an acceptable quality.

20 In the existing silkscreen technique, a screen is used that is comprised of a plastic material or metal, but must resist to a temperature of maximum 100°C, and that is attached to a wooden or metallic frame. The screen is covered with an impermeable layer, except in the spots where ink must be able to pass the screen to form the image to be printed on the substrate.

25 The pasty thermoplastic inks are placed on the screen. The screen is heated, so that the thermoplastic ink becomes fluid.

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By means of a doctor blade of plastic material or metal, the thermoplastic ink is pushed through the screen, only through the openings that show the image directly on the product: glass, ceramics or china. This method has the following limitations:

- limited in resolution by the use of a screen, of which the density of the threads forming the screen is physically limited;
- can only be used for printing flat and cylindrical objects;
- quality is sharply reduced as soon as the surface of the object to be printed is bent inside or outside.

Apart from silkscreen printing, also the technique known as pad printing may be used.

Pad printing with thermoplastic ink has known little succes up to now, because of lack of reliability and lack of constant quality.

In the technique which is known as "pad printing", an engraved printing plate is used, which in a first stage is inked over its entire surface, whereupon with a doctor blade the excess ink is scraped off, and collected in an ink duct or the like. The ink thus exclusively remains in the engraved parts.

The different operations involved in this, may be summarized as follows:

1) The doctor blade holder with slab is removed from the printing plate and is kept at a distance from the printing plate during the inking stage.

2) The doctor blade holder with slab is moved with respect to the printing plate during the inking stage, in the longitudinal direction thereof.

3) After the inking stage, the doctor blade is brought into contact with the printing plate.

4) The doctor blade is moved with respect to the printing plate; the ink is scraped off, except in the engraved portions, and is collected in an ink tank.

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It is clear that the relative movements of the doctor blade holder with slab, with respect to the printing plate, are the result from both a moving of these parts with respect to a stationary printing plate, and the reverse, and that consequently both the printing plate and the doctor blade and the slab can be moved in opposite sense.

The doctor blade is always adjusted in such a way with respect to the printing plate, that it forms a sharp angle with this plate, with the portion of the printing plate that has been inked and must yet be scraped off.

The techniques which are generally applied and briefly described, show a series of disadvantages which can be summarized as follows:

a) The printing plate is subjected to high wear, because of the pressure exerted by the doctor blade on the printing plate. A good scraping off of the ink is indeed an absolute requirement, and this requires, at the installation of the doctor blade as described above, a high pressure of the doctor blade on the printing plate.

b) Each time, two movements are required, which can be summarized as follows: up or down movement of the doctor blade knife during the relative movements of the doctor blade with respect to the printing plate.

Since thermoplastic inks are used, which must be held at a constant, controlled temperature, many disadvantages are associated to this system. These are summarized hereafter:

25                 - severe wear of the printing plate and doctor blade knife because of the required high pressure of the doctor blade knife on the printing plate, which strongly affects the print quality in a negative way.

30 - problems to keep the temperature at a constant level during the up and down movements of the doctor blade knife, which is continuously heated and cooled, as a result of which the doctor blade knife is rapidly "polluted" by hardened ink.

The combination of above disadvantages is the reason why a production with a constant print quality is almost impossibly feasible.

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17-05-2001

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NO. 498 029  
BE 000000044

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- 5 PATENT ABSTRACTS OF JAPAN vol. 15, no. 491 (M-1190), 12 December 1991  
(1991-12-12) & JP 03 213341 A (THINK LAB KK), 18 September 1991 (1991-09-  
18) discloses a process for inking an etched printing cylinder with an ink which  
reduces viscosity by heating, whereby a relative movement is maintained between  
the etched surface and an ink tank filled with said ink, wherein the ink tank is  
10 heated at the temperature required for this ink. However, these teachings are not  
straightforwardly suitable for thermoplastic ink.

AMENDED SHEET

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It is the aim of the invention to remediate the disadvantages of this known technique, and to prescribe a process and a device ensuring with technically reliable means, an increased life of the printing plate and enabling a reliable use of thermoplastic inks.

5 In order to make this possible according to the invention, the holder or the ink tank, or both these components, are heated to the temperature required for the thermoplastic ink.

10 In a first possible embodiment, as an ink tank, an electrically heated ink tank is used, with circular or oval doctor blade of a hard material, such as hard metal or plastic material in the shape of a monolithic component of undeformable material, in which, at the periphery a circular or oval canal is made for attaching above said doctor blade by snap connection, as well as for attaching above said doctor blade to this component by glueing.

15 According to another possible embodiment, a device is used consisting of a combination of a heated ink tank and at least one doctor blade, of which at least the bottom edge which is contacting the printing plate, is adjusted with respect to the printing plate at a negative angle, measured with respect to the inked portion of the printing plate to be scraped off, and without changing the position of the doctor blade, a relative movement of the  
20 doctor blade with respect to the printing plate is generated, on the one hand, in a direction to ink the printing plate, and on the other hand, in the other direction, to scrape off the ink from the printing plate.

The invention also relates to closed ink tanks to be used within the frame of the invention.

25 Other details and advantages of the invention will show from the process for inking a printing plate attached to a holder, with thermoplastic ink and the ink tank used herein according to the invention. The reference numbers refer to the attached figures.

30 Figures 1 to 4 schematically illustrate a classical pad printing process.

Figure 5 schematically shows a closed ink tank with heated printing plate holder.



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Figure 6 schematically shows a closed ink tank with heated printing plate.

Figure 7 schematically shows a closed ink tank with heated holder.

5 Figure 8 schematically shows a closed ink tank with heated ink tank.

Figure 9 schematically shows a closed doctor blade chamber with heated printing plate holder.

10 Figure 10 schematically shows a closed doctor blade chamber with heated printing plate.

Figure 11 schematically shows a closed and heated doctor blade chamber.

The process shown by figures 1-4 schematically, but clearly illustrates the different steps of inking in the pad printing technique.

15 1 refers to the printing plate which is fixed in a holder 2, the deepened part of which forms the ink chamber 3, in which the ink is collected after the scraping off of the printing plate 1. In principle, a device for inking a printing plate always comprises an ink slab 4 and a doctor blade 5. These components are separately moved up and down by means which will not be described in detail here.

20 It is clear that the relative movements of the doctor blade holder with slab, with respect to the printing plate, are the result of both a movement of these components with respect to a stationary printing plate, and the reverse, and consequently that both the printing plate and the doctor blade with slab can be moved in opposite sense.

25 The techniques generally applied and briefly described show a series of disadvantages which can be summarized as follows:

- 30 a) The doctor blade is always adjusted in such a way with respect to the printing plate, that it forms a sharp angle with this plate, with the portion of the printing plate that has been inked and must yet be scraped off.
- b) The printing plate is subjected to high wear, because of the pressure exerted by the doctor blade on the printing plate. A good scraping off of the

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ink is indeed an absolute requirement, and this requires, at the installation of the doctor blade as described sub a), a high pressure of the doctor blade on the printing plate.

- 5 c) Each time, two movements are required, which can be summarized as follows: up or down movement of the doctor blade knife during the relative movements of the doctor blade with respect to the printing plate.

Since thermoplastic inks should be held at a constant controlled temperature, many disadvantages are connected to the process just described. These disadvantage are, i.a.

- 10 • severe wear of printing plate and doctor blade knife because of the required high pressure of the doctor blade knife on the printing plate, which strongly affects the print quality in a negative way.
- problems to keep the temperature at a constant level during the up and down movements of the doctor blade knife, which is continuously heated and cooled, as a result of which the doctor blade knife is rapidly "polluted" by hardened ink.
- 15

The combination of above disadvantages is the reason why a production with a constant print quality is almost impossibly feasible.

20 According to the invention now, because of the use of thermoplastic inks, a heated printing plate holder 4 or a closed, heated ink tank is used, but it will immediately be obvious that both these components could be heated.

The different embodiments of the process and the holders or ink tanks to be used herein, will be discussed hereafter.

25 In the embodiment according to figure 5, a printing plate 6 is used that is fixed into the printing plate holder 7. With 8, reference is made to an inking chamber with holder 9. So in this embodiment, only the printing plate holder 7 is heated.

30 Figure 6 concerns an alternative of the invention according to which the printing plate 6 is heated, whereas neither the printing plate holder 7, nor the inking chamber 8 are heated. As has been said before, a combination of the embodiments described just now, is conceivable.

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In the embodiment according to figure 7, exclusively the inking chamber holder 9 is heated, whereas according to figure 8, only the inking chamber 8 is heated. In the spirit of the invention, the embodiments according to figures 5-8 can be both mutually combined.

5 The closed chambers 10 according to figures 9-11 relate to a very remarkable embodiment of the inking chamber to be used with this application. The closed inking chambers are combined here according to the embodiment described hereafter; i.e.

- 10 a) (Fig. 9) Here the inking chamber 10 is used in combination with a heated printing plate holder 7;  
b) (Fig. 10) Here, exclusively the printing plate 6 is heated;  
c) (Fig. 11) In this embodiment, exclusively the inking chamber 10 is heated.

In the spirit of the invention, the embodiments according to figures 9-11 may be mutually combined.

15 The inking chamber 10 is a particularly attractive embodiment. It consists of a housing 11, which in combination with two doctor blades 12, forms a completely closed inking chamber 13.

20 The ink 14 present in the inking chamber is spread out on and scraped off from the printing plate, simultaneously by both the doctor blades 8.

Because of the particular angle at which the doctor blades 8 are adjusted with respect to the printing plate 6, an "inking gap" of the closed inking chamber is realised, which is particularly advantageous for the use of thermoplastic inks.

25 The implementation of a closed inking chamber of the type illustrated by figures 9, 10 and 11, creates ideal conditions for the use of thermoplastic inks.

30 The striking advantages of the process according to the invention and of the closed inking chambers used herein, may be summarized as follows:

- a) Since there are no up- and downward movements of both the closed inking chamber and the doctor blade chamber mechanism, these cannot cool

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down.

- b) Due to the limited amount of used thermoplastic ink which will be used according to the process, maintaining a constant temperature is simpler.
- c) Minimum wear of the printing plate, because the pressure of the doctor blade chamber or inkpot on the printing plate is low.
- d) Printing plates and ink are easily exchangeable, with very short exchange times.
- e) A very economical ink consumption, because the ink losses upon cleaning are very small.
- f) Because of the limited amount of used thermoplastic ink, and the absence of an ink tank, the machine more rapidly arrives at operating temperature after switching on, when starting up at room temperature.

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### AMENDED CLAIMS

1. Process for inking a printing plate attached to a holder, with a thermoplastic ink, to be used in pad printing, whereby a relative movement is maintained between the holder and an ink tank filed with thermoplastic ink, characterised in that the holder or the ink tank, or both these components are heated at the temperature required for the thermoplastic ink, wherein the ink is heated to about 80°C.
2. Process according to claim 1, characterised in that as an ink tank, a heated ink tank is used, with circular or oval doctor blade of a hard material, such as hard metal or plastic material in the shape of a monolithic component of undeformable material, in which at the periphery a circular or oval canal is made for attaching above said doctor blade by snap connection, as well as for attaching above said doctor blade to this component by glueing.
3. Process according to claim 1, characterised in that as an ink tank, a device is used consisting of the combination of a heated ink tank and at least one doctor blade, of which at least the bottom edge which is contacting the printing plate; is adjusted with respect to the printing plate at a negative angle, measured with respect to the inked portion of the printing plate to be scraped off, and without changing the position of the doctor blade, a relative movement of the doctor blade with respect to the printing plate is generated, on the one hand, in a direction to ink the printing plate, and on the other hand, in the other direction, to scrap off the ink from the printing plate.
4. Ink tank to be used in the application of the process according to claim 2, characterised in that it is heatable being provided with circular or oval doctor blade of hard material, such as hard metal or plastic material, and in that it is realised in the shape of a monolithic component of an undeformable material, in which, at the periphery a circular or oval canal is made for attaching above said doctor blade by

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5. Ink tank according to claim 4, characterised in that above said hard material is a synthetic substance.

10 7. Ink tank according to any one of claims 5 and 6, characterised in that above  
said doctor blade of above said synthetic substance is attached by an adhesive.

8. Ink tank according to claim 4, characterised in that above said doctor blade of above said synthetic substance is attached to the monolithic component by a snap connection.

9. Ink tank according to any one of claim 4-5, characterised in that above said doctor blade, during spraying or casting of above said synthetic substance of which above said ink tank is made, was joined to it.

10. Heatable ink tank for implementing the process according to claim 3, characterised in that it consists of the combination of

a) an ink tank for inking the printing plate during a relative movement of the printing plate with respect to this ink tank, and of

25 b) at least one doctor blade of which the bottom edge which is contacting the printing plate, is adjusted with respect to the printing plate at a negative angle, meaning an angle measured with respect to the inked portion of the printing plate that has yet to be scraped off.

30 11. Ink tank according to claim 10, characterised in that above said doctor blade is adjusted at a negative angle between substantially 90 and substantially 180°.

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12. Ink tank according to any one of claims 10 and 11, characterised in that it is elongated and forms with above said doctor blade an elongated ink gap.

5 13. Ink tank according to claim 12, characterised in that above said doctor blade and the ink tank are mounted on a common elongated housing.

14. Ink tank according to claim 13, characterised in that above said doctor blade and above said elongated housing form a whole.

10

15. Ink tank according to any one of claims 10-14, characterised in that two doctor blades are mounted facing each other.

15 16. Ink tank according to any one of claims 10-15, characterised in that above said doctor blade forms a closed circle and that a portion of the doctor blade extends according to above said negative angle.

17. Ink tank according to any one of claims 13-16, characterised in that above said housing, a heating resistance is mounted.

20

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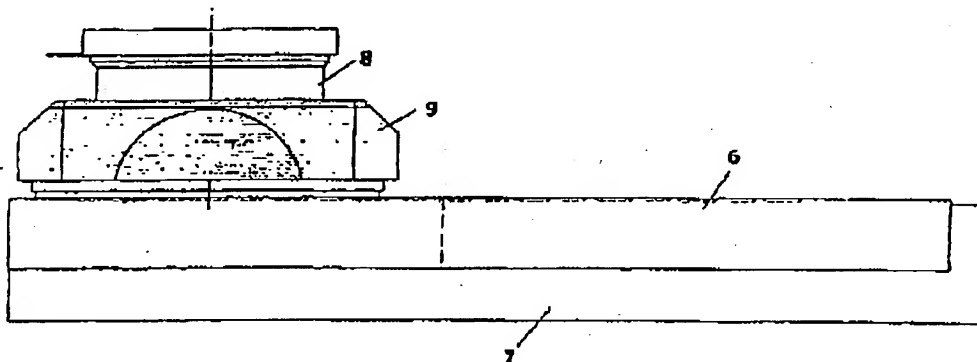
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WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>A1</b>		(43) International Publication Date: 9 November 2000 (09.11.00)
(21) International Application Number: PCT/BE00/00044		(81) Designated States: AE, AG, AL, AM, AT, AU, BA, BB, BG, BR, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, US, UZ, VN, YU, ZA, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 21 April 2000 (21.04.00)		
(30) Priority Data: 99870075.1 29 April 1999 (29.04.99) EP		
(71) Applicant (for all designated States except US): PRINTING INTERNATIONAL [BE/BE]; Industriepark, Ambachtenlaan 12, B-9880 Aalter (BE).		
(72) Inventor; and (75) Inventor/Applicant (for US only): DE VOLDER, Laurent [BE/BE]; Alterstraat 11, B-9880 Aalter (BE).		
(74) Agent: VAN CUTSEM, Paul; Avenue Winston Churchill 152/6, B-1180 Bruxelles (BE).		Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments. In English translation (filed in Dutch).

(54) Title: PROCESS FOR INKING A PRINTING PLATE WITH THERMOPLASTIC INKS AND INK TANKS TO BE USED THEREIN



## (57) Abstract

The invention relates to a process for inking a printing plate attached to a holder, with a thermoplastic ink, to be used in pad printing, whereby a relative movement is maintained between the holder and an ink tank filled with thermoplastic ink, characterised in that the holder or the ink tank, or both these components are heated at the temperature required for the thermoplastic ink. The invention also relates to the ink tanks to be used in this process.

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FIG. 1

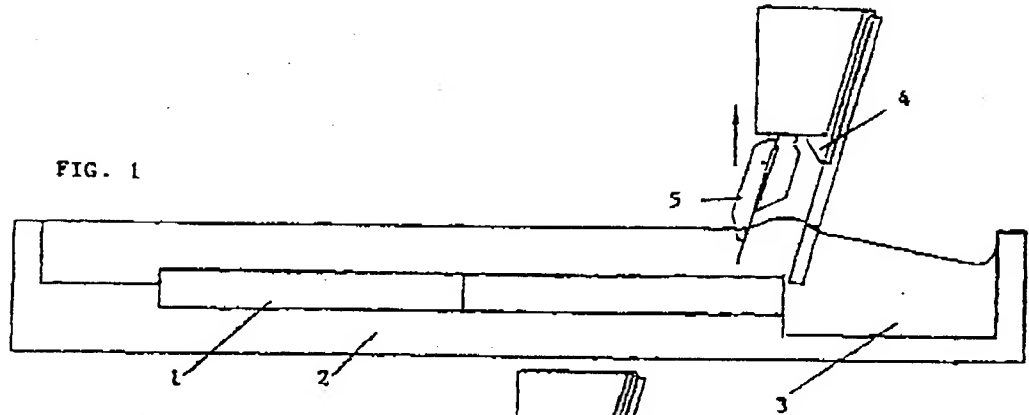


FIG. 2

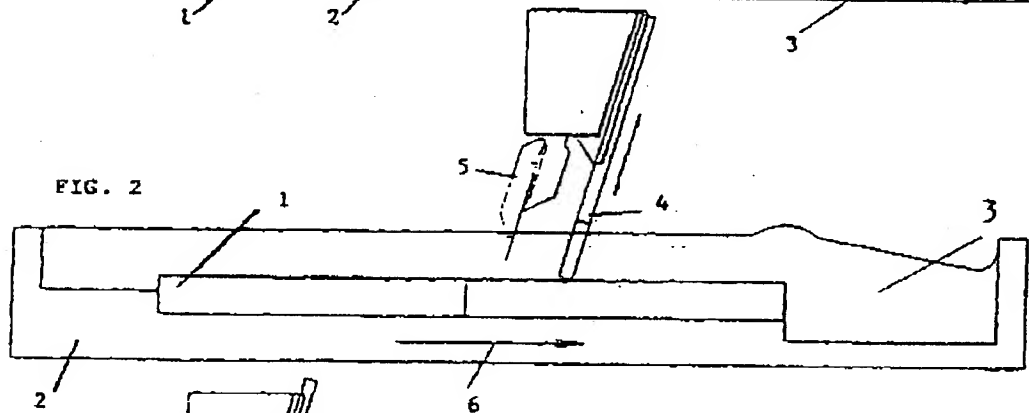


FIG. 3

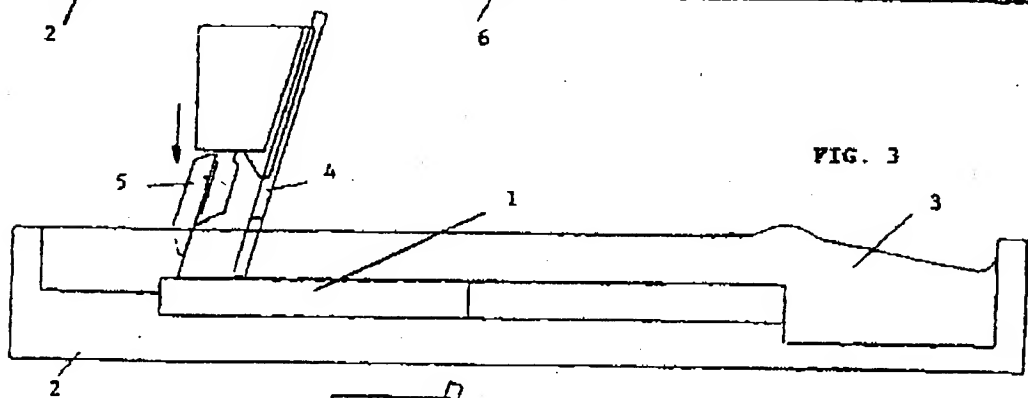
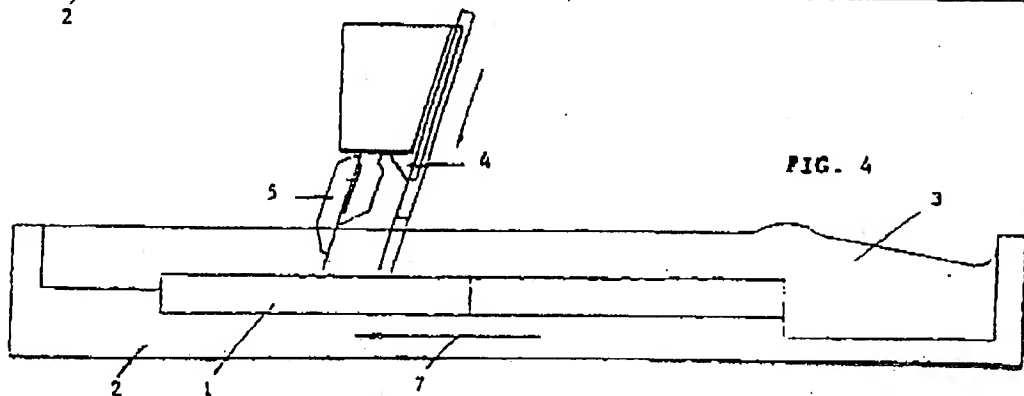


FIG. 4



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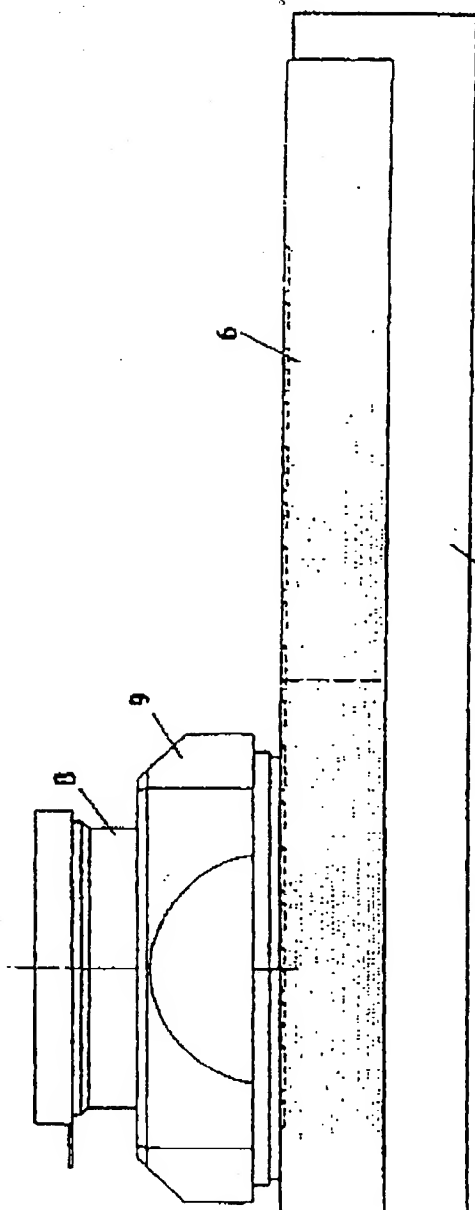


FIG. 5

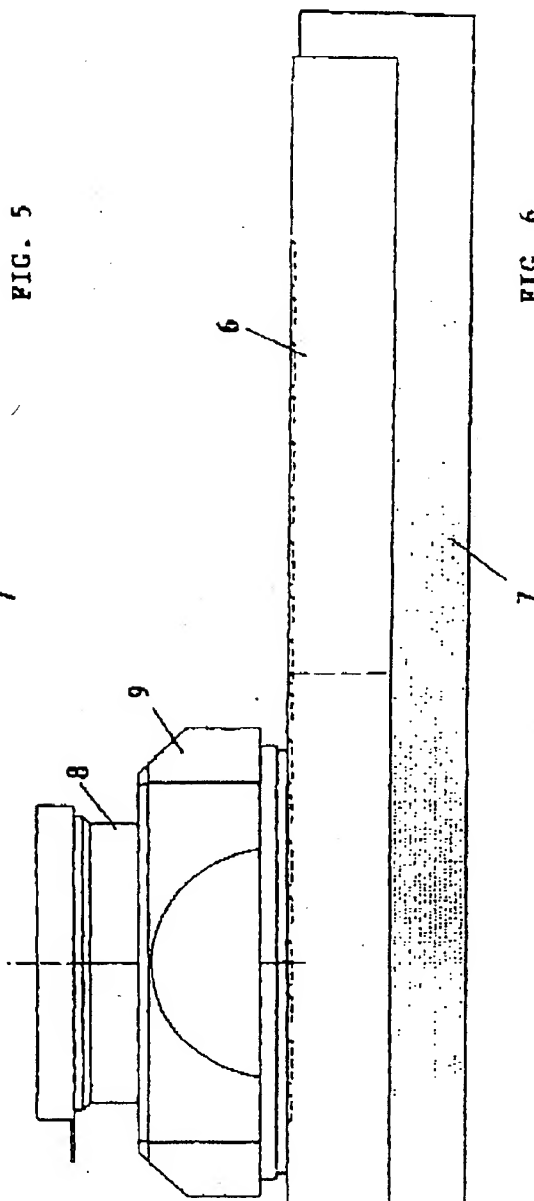


FIG. 6

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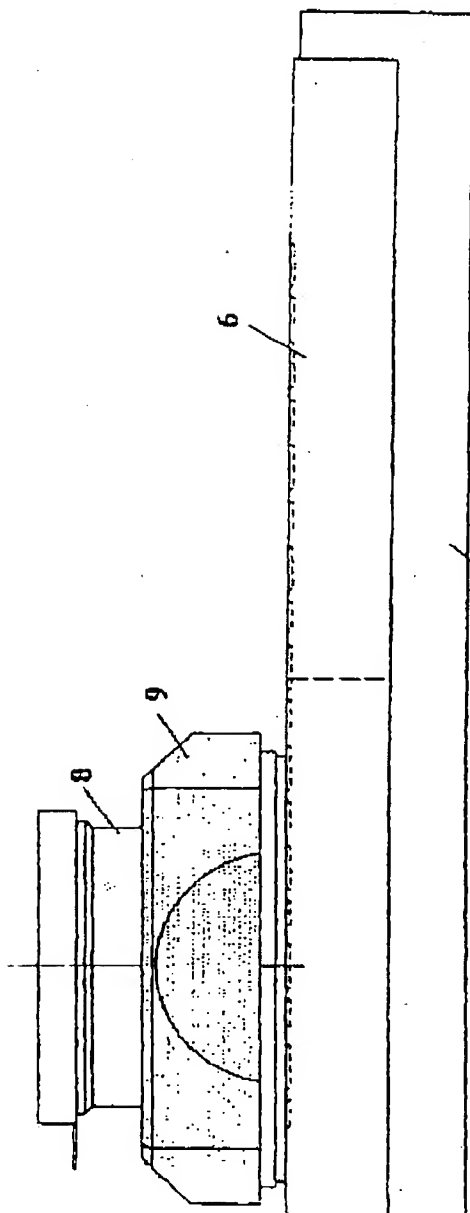


FIG. 7

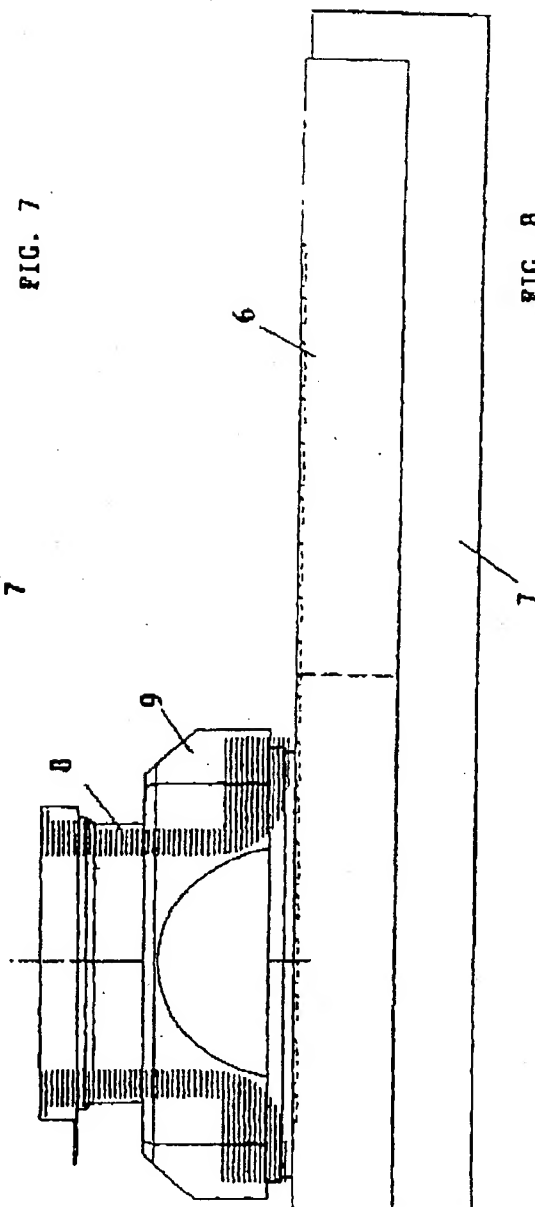


FIG. 8

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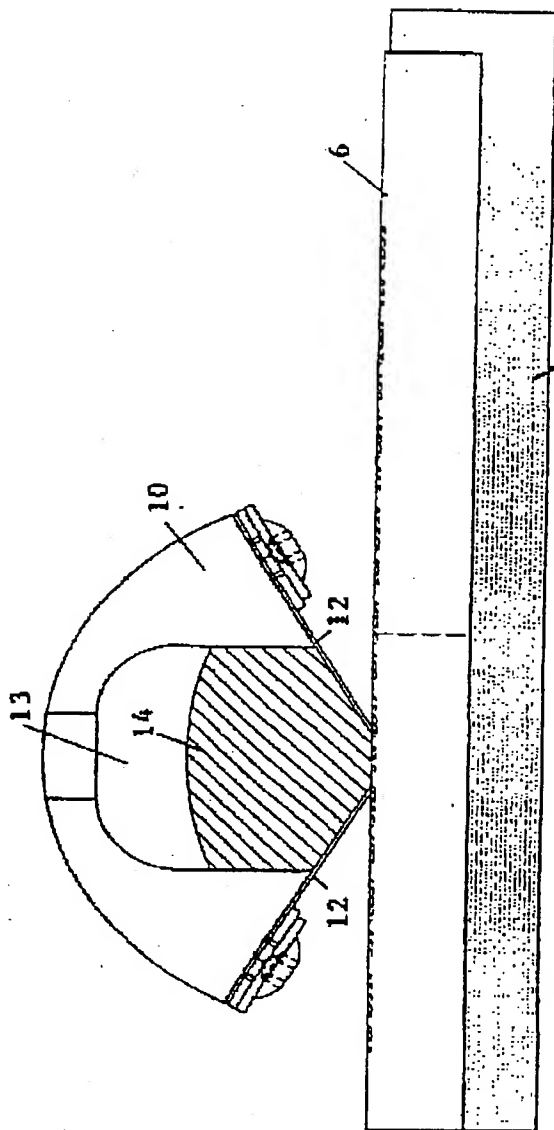
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FIG. 9

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13

10

14

11

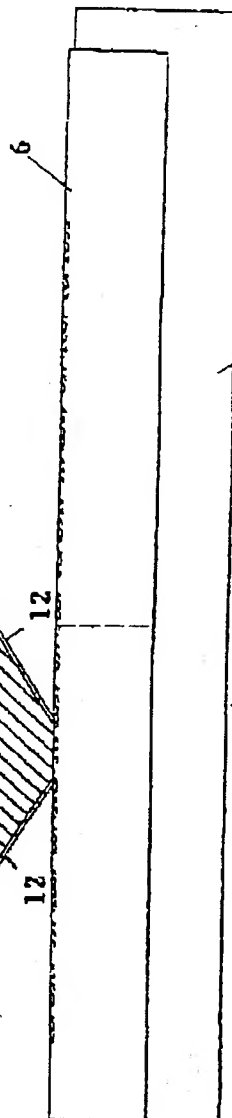


FIG. 10

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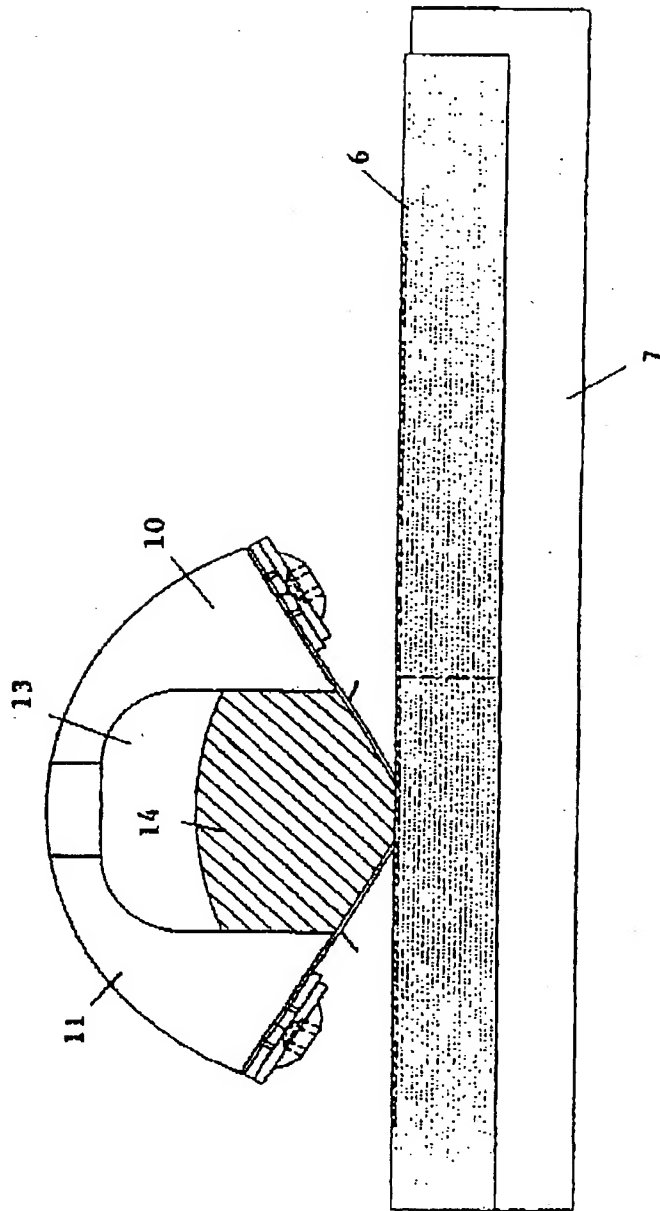


FIG. 11

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Practitioner's Docket No. U 013688-5

**PATENT**

Optional Customer No. Bar Code



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PATENT TRADEMARK OFFICE

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**COMBINED DECLARATION AND POWER OF ATTORNEY**

---

(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,  
CONTINUATION, OR C-I-P)

---

As a below named inventor, I hereby declare that:

**TYPE OF DECLARATION**

This declaration is of the following type:

*(check one applicable item below)*

- ☐ original.  
☐ design.

**NOTE:** *With the exception of a supplemental oath or declaration submitted in a reissue, a supplemental oath or declaration is not treated as an amendment under 37 CFR 1.312 (Amendments after allowance). M.P.E.P. Section 714.16, 7<sup>th</sup> Ed.*

- ☐ supplemental.

**NOTE:** *If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.*

- ☒ national stage of PCT.

**NOTE:** *If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.*

**NOTE:** *See 37 C.F.R. Section 1.63(d) (continued prosecution application) for use of a prior nonprovisional application declaration in the continuation or divisional application being filed on behalf of the same or fewer of the inventors named in the prior application.*

- ☐ divisional.  
☐ continuation.

**NOTE:** *Where an application discloses and claims subject matter not disclosed in the prior application, or a continuation or divisional application names an inventor not named in the prior application, a continuation-in-part application must be filed under 37 C.F.R. Section 1.53(b) (application filing requirements-nonprovisional application).*

- ☐ continuation-in-part (C-I-P).

## INVENTORSHIP IDENTIFICATION

**WARNING:** *If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.*

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

## TITLE OF INVENTION

PROCESS FOR INKING A PRINTING PLATE WITH THERMOPLASTIC INKS AND INK  
TANKS TO BE USED THEREIN

## SPECIFICATION IDENTIFICATION

The specification of which:

(complete (a), (b), or (c))

(a) ☐ is attached hereto.

**NOTE:** *"The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 C.F.R. Section 1.63:*

*"(1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing;*

*"(2) name of inventor(s), and attorney docket number which was on the specification as filed; or*

*"(3) name of inventor(s), and title which was on the specification as filed."*

*Notice of July 13, 1995 (1177 O.G. 60).*

(b) ☐ was filed on \_\_\_\_\_, ☐ as Application No. \_\_\_\_\_  
☐ and was amended on \_\_\_\_\_ (if applicable).

**NOTE:** *Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 C.F.R. Section 1.67.*

**NOTE:** *"The following combinations of information supplied in an oath or declaration filed after the filing date are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 C.F.R. Section 1.63:*

(A) *application number (consisting of the series code and the serial number, e.g., 08/123,456);*

(B) *serial number and filing date;*

(C) *attorney docket number which was on the specification as filed;*

(D) *title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or*

(E) *title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number, e.g., 08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration.*

*M.P.E.P. Section 601.01(a), 7th ed.*

- (c) ☒ was described and claimed in PCT International Application No. PCT/BE00/00044 filed on April 21, 2000 and as amended under PCT Article 19 on \_\_\_\_\_ (if any).

**SUPPLEMENTAL DECLARATION (37 C.F.R. Section 1.67(b))**

*(complete the following where a supplemental declaration is being submitted)*

☐ I hereby declare that the subject matter of the

☐ attached amendment

☐ amendment filed on \_\_\_\_\_.

was part of my/our invention and was invented before the filing date of the original application, above identified, for such invention.

**ACKNOWLEDGMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR**

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, Section 1.56,

*(also check the following items, if desired)*

☐ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and

☐ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 C.F.R. Section 1.98.

**PRIORITY CLAIM (35 U.S.C. Section 119(a)-(d))**

**NOTE:** "The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by Section 1.63. The claim for priority and the certified copy of the foreign application specified in 35 U.S.C. Section 119(b) must be filed in the case of an interference (Section 1.630), when necessary to overcome the date of a reference relied upon by the examiner, when specifically required by the examiner, and in all other situations, before the patent is granted. If the claim for priority or the certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in Section 1.17(i). If the certified copy is not in the English language, a translation need not be filed except in the case of interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate." 37 C.F.R. Section 1.55(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

*(complete (d) or (e))*



- (d) ☐ no such applications have been filed.  
 (e) ☒ such applications have been filed as follows.

**NOTE:** Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS  
 (6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION  
 AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. SECTION 119(a)-(d)**

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING DAY, MONTH, YEAR	PRIORITY CLAIMED UNDER 35 USC 119
EP	99870075.1	29 April 1999	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)  
 (35 U.S.C. Section 119(e))**

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below:

**PROVISIONAL APPLICATION NUMBER**

**FILING DATE**

\_\_\_\_\_/\_\_\_\_\_  
 \_\_\_\_\_/\_\_\_\_\_  
 \_\_\_\_\_/\_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**CLAIM FOR BENEFIT OF EARLIER U.S./PCT APPLICATION(S)  
 UNDER 35 U.S.C. SECTION 120**

- ☐ The claim for the benefit of any such applications are set forth in the attached  
 ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY  
 FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART (C-I-P)  
 APPLICATION.

ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS  
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

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NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. Section 120.

**POWER OF ATTORNEY**

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

*(list name and registration number)*

JOSEPH H. HANDELMAN, 26179

JOHN RICHARDS, 3T053

RICHARD J. STREIT, 25765

PETER D. GALLOWAY, 27885

RICHARD P. BERG, 28145

JULIAN H. COHEN, 20302

WILLIAM R. EVANS, 25858

JANET I. CORD, 33778

CLIFFORD J. MASS, 30086

CYNTHIA R. MILLER, 34678

10

*(Check the following item, if applicable)*

- ☐ I hereby appoint the practitioner(s) associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.
- ☐ Attached, as part of this declaration and power of attorney, is the authorization of the above-named practitioner(s) to accept and follow instructions from my representative(s).

NOTE: "Special care should be taken in continuation or divisional applications to ensure that any change of correspondence address in a prior application is reflected in the continuation or divisional application. For example, where a copy of the oath or declaration from the prior application is submitted for a continuation or divisional application filed under 37 CFR 1.53(b) and the copy of the oath or declaration from the prior application designates an old correspondence address, the Office may not recognize, in the continuation or divisional application, the change of correspondence address made during the prosecution of the prior application. Applicant is required to identify the change of correspondence address in the continuation or divisional application to ensure that communications from the Office are mailed to the current correspondence address. 37 CFR 1.63(d)(4)." Section 601.03, M.P.E.P., 7th Ed

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SEND CORRESPONDENCE TO

~~Ladas & Parry,~~  
~~26 West 61<sup>st</sup> Street~~  
New York, N.Y. 10023

---

DIRECT TELEPHONE CALLS TO:  
*(Name and telephone number)*

**WILLIAM R. EVANS**  
**212-708-1930**

---

*(complete the following if applicable)*

Since this filing is a [ ] continuation [ ] divisional there is attached hereto a Change of Correspondence Address so that there will be no question as to where the PTO should direct all correspondence.

#### DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

# SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other document.

NOTE: Each inventor must be identified by full name, including the family name, and at least one given name without abbreviation together with any other given name or initial, and by his/her residence, post office address and country of citizenship. 37 C.F.R. Section 1.63(a)(3).

NOTE: Inventors may execute separate declarations/oaths provided each declaration/oath sets forth all the inventors. Section 1.63(a)(3) requires that a declaration/oath, inter alia, identify each inventor and prohibits the execution of separate declarations/oaths which each sets forth only the name of the executing inventor. 62 Fed. Reg. 53,131, 53,142, October 10, 1997.

## Full name of sole or first inventor

LAURENT  
(Given Name)

(Middle Initial or Name)

DE VOLDER  
Family (Or Last Name)

Inventor's signature (X)

Date (X) 11/10/2002 Country of Citizenship Belgium

Residence Aalterstraat 11, B-9880 Aalter, Belgium

Post Office Address same as above

## Full name of second joint inventor, if any

(Given Name)

(Middle Initial or Name)

Family (Or Last Name)

Inventor's signature

Date Country of Citizenship

Residence

Post Office Address

## Full name of third joint inventor, if any

(Given Name)

(Middle Initial or Name)

Family (Or Last Name)

Inventor's signature

Date Country of Citizenship

Residence

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[ ] **Signature** for fourth and subsequent joint inventors. *Number of pages added* \_\_\_\_\_

[ ] **Signature** by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. *Number of pages added* \_\_\_\_\_

[ ] **Signature** for inventor who refuses to sign or cannot be reached by person authorized under 37 C.F.R. Section 1.47. *Number of pages added* \_\_\_\_\_

[ ] Added page for **signature** by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 C.F.R. Section 1.47)

• [ ] Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.

[ ] Number of pages added \_\_\_\_\_

☐ Authorization of practitioner(s) to accept and follow instructions from representative.

[x ] This declaration ends with this page.

Declaration ends with this page.

